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COPD

Information for patients

COPD Treatment with Stem Cells from your own **Bone Marrow / Adipose Tissue**

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COPD Treatment

The best way to protect your lungs from a sudden catastrophe of COPD is to stay away from active as well as passive smoking. COPD is creating a major chaos by affecting millions of men and women worldwide. **Chronic Obstructive Pulmonary Disease** is characterized by poor passage of airflow associated with the breathing difficulty. Apart from the one stated above air pollutants, chemical fumes, dust, etc. can also contribute to COPD.

The condition is grouped by two co-existing diseases, namely chronic bronchitis and emphysema associated with mucus formation and breakdown of air sacs; ultimately resulting in air blockages. To know the exact anatomy of the disease, we first need to know how our lungs work! They are one of the most diligent devices of our body pumping several times in a minute to supply oxygenated blood all over the body and expel carbon dioxide. This process of inhalation and exhalation of air is primarily authorized by a network of tiny tubules in our lungs called as Bronchioles or Airway Tubes.

These tubes further end in a small round sac like structure called Air Sacs. They are elastic structures and when we breathe in, they are filled up by air like a small balloon and upon breathing out, they deflate and the air goes out. Because of different complications such as weakened elasticity, damage to air sacs, inflammation and clogging of airways due to excessive mucus formation, the natural functioning of the lungs is challenged causing breathing interruptions. It is possible to decelerate the progress of the disorder and some important aspects of life can be bettered to the considerable extent.

What is the prognosis?

The symptoms of COPD include wheezing, breathlessness when resting or active, tight chest and cough producing more mucus or phlegm. The symptoms might appear or get worse when you have an infection or breathe in smoke or fumes.

You might be counseled for a history of smoking, asthma or long term exposure to dust or any other pollutants that could have impaired your lungs.
To confirm; you will need to take a breathing test known commonly as “Spirometry”. The test is done to measure sizes of lungs and the amount of air flowing in and out of your body.

Besides; doctor may ask you to undergo blood and sputum tests for lung infections and chest X-ray to check upto what extent airways are narrowed down.

Is there any treatment?

As of now perpetual cure is not available for COPD, but with the help of supportive approach and some lifestyle changes we can relax symptoms to certain degrees. These strategies may include bronchodilators,when ingested through inhalers can relax lung muscles and open airways. Steroids can reduce swelling in the lungs, expectorants which is important for expelling mucus outside the lungs, counseling for momentary, not reversing the damage. But with the unique regenerative properties of stem cells, it is now smoking cessation.

The treatments available are possible to keep up with the disruptive inflammatory action caused by COPD.
As these are groomed to repair and regenerate normal wear and tear of the body; they can competently produce a habitat to facilitate production of growth hormones and cytokines and thus augment the regeneration of dead cells.

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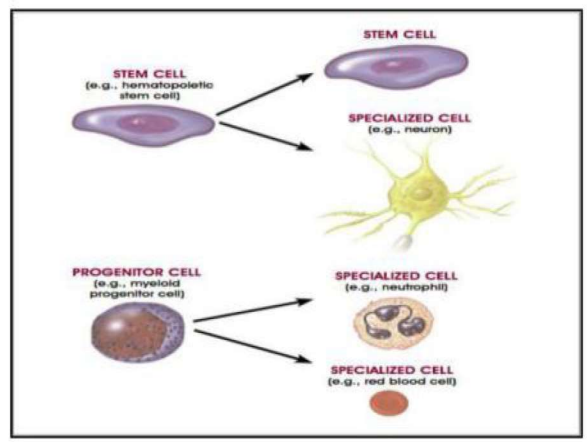
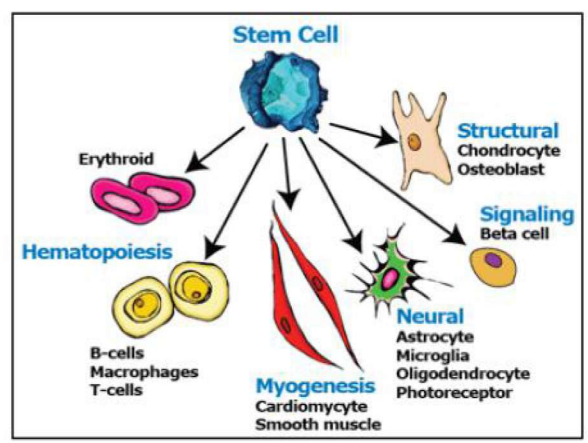
About Stem Cells

Stem cells are basically the "Master Cells" of the human body. These unspecialized cells lie dormant throughout the life and get activated when signals elicit from the site of injury. Upon enlivening they get navigated to the site of injury with the help of strong immune response stimulated by the body. At the site with the help of a programmed cell division they get differentiated into the specialized tissue specific cells. These newly formed daughter cells will be replaced for the damaged one, thus ceasing further progression of the diseased cells.

Thus, stem cells are known to be vital to the body for its normal wear and tear due to their exclusive characteristics such as

1. Undifferentiated cells capable of giving rise to any tissue specific cells.
2. Capability of prolonged self renewal having an unlimited life span and thus maintaining their number intact.
3. The ability to trigger the secretion of certain hormones and grow factors at the site of injury to facilitate damage repair.





Types of Stem Cells

With respect to their origin these Stem cells are broadly classified into two main naturally occurring cell types such as Embryonic stem cells and Adult stem cells. The third one is reprogrammed in the lab to satisfy ethical as well as scientific demands; they are named as Induced Pluripotent stem cells

Embryonic Stem Cell

These cells are the most preliminary cells isolated from the inner cell mass of the blastocyst of preimplantation stage embryos. With their unlimited expansion capacity and ability to differentiate into almost all cell types of the body; earlier they were considered as the potential sources of the regenerative medicines. But the increasing, burden of ethical speculations and animal studies showing abnormal occurrence of tumor ex vivo rendered them ineffective for the therapeutic application.

Adult Stem Cells

These cells are settled in adult body organs. They are less controversial due to their ease of isolation

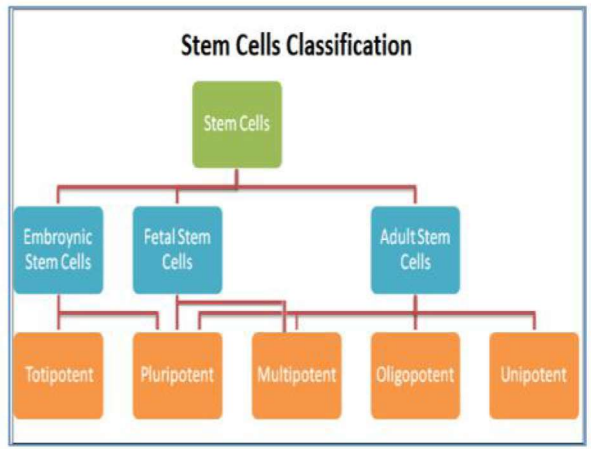
and their production does not require any destruction of embryo. These cells pose a very low or no risk of immune rejection when applied as therapeutic.

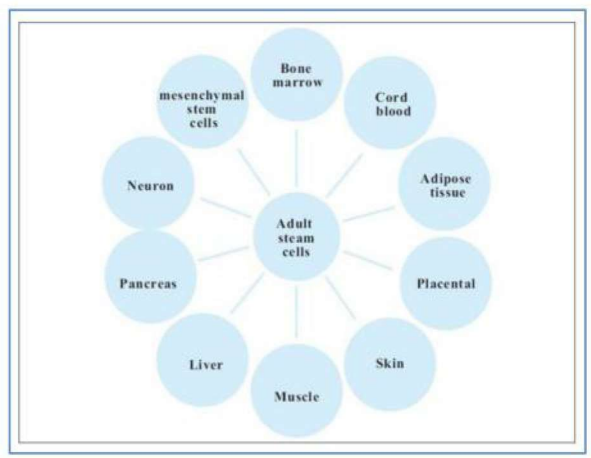
Since they are present in an adult fully grown organ, they are capable of differentiating cell of their lineage only contrary to the embryonic stem cells giving rise to all lineages. Apparently these cells can be directed to become specific cells with the addition of specific growth factors. These properties make them attractive candidates for the therapeutic application in the contemporary field of regenerative medicine.

Induced Pluripotent Stem Cells (iPSCs)

These are adult somatic cells genetically reprogrammed in vitro to an embryonic stem cell like state by being forced to express gene such as OCT-4; important for maintaining Pluripotent property of embryonic stem cells. Although the technology is still in a juvenile state; additional research is needed to use them in transplantation medicine.

Out of the different types mentioned above Adult Autologous Stem cells are known as the most potent and versatile. They are thus the most opted cell sources due to easy isolation, demonstrative plasticity and minimum ethical barricades.





Examples of Autologous stem cell sources are Bone Marrow, Adipose Tissue etc. and we have achieved ultimate expertise over it.

The Advancells COPD Treatment

Advancells uses very comprehensive and individualized treatment pattern, by obtaining stem cell from two sources adipose-derived stem cells (ASCs) and bone marrow-derived stem cells (BMSCs). Through our multidisciplinary team of specialists; we are giving the best treatment possible to improve recovery.

The entire procedure consists of following phases:

Pre Treatment Assessments, Stem cell procedure, Stem cell Implantation and Rehabilitation.

Objectives of the Treatment

To provide an alternative treatment regimen that will be mainly focused on reparation and regeneration of the damaged parts and thus improve pathogenesis, diagnosis, monitoring and management of COPD.

Type of Treatment

The procedure exploits the use of Autologous Stem Cells isolated from your own body.

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Being an Autologous they are not rejected by the body and hence are completely safe and risk free. At present we are isolating stem cells from two sources such as **"Bone Marrow"** and **"Adipose Tissue"**. Both these sources are available in abundance from where stem cells can be easily isolated without many manipulations.

Once you are enrolled with us for the treatment, we will intimate you regarding the date and time of the treatment. The entire treatment plan will be divided into three parts;

1. **Inductive Support**: - Complete assistance will be given to the patient in all pre treatment procedures such as consultation, hospitalization (If required), Assessments.

2. **Stem Cell Procedure**: - Generally the entire procedure takes around 7-8 hrs including 1-2 hrs of source aspiration, 2-3 hrs of stem cell isolation and injection of the isolated stem cells back into the body. The processing of sample is done in a state of the art class 10000 clean room facility wherein we strictly adhere to maintain quality of standards. Wherein the extracted sources undergo minimum manipulation such as been spun in a centrifuge to cull out a stem cells.

ADVANCELLS STEM CELL TREATMENTS

Adipose Tissue Extraction

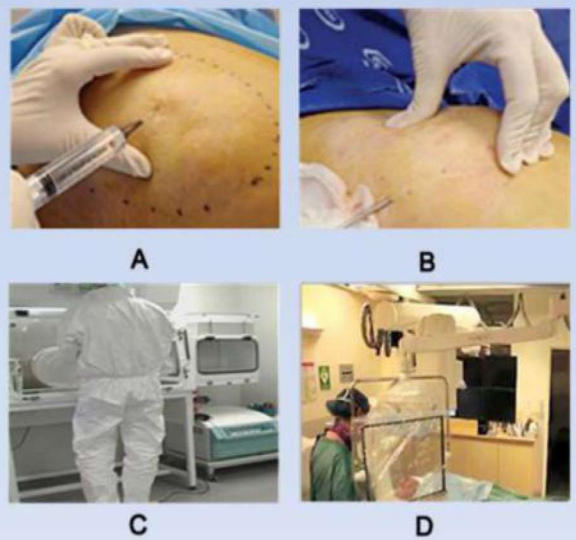


Figure 1: Adipose Tissue collection procedure

A. Application of tumescent anesthesia
B. Adipose Tissue collection by lipoaspiration
C. Isolation of Stem Cells in the clean room
D. Intra-arterial catheter based Injection of stem cells at the targeted site

Bone Marrow Extraction

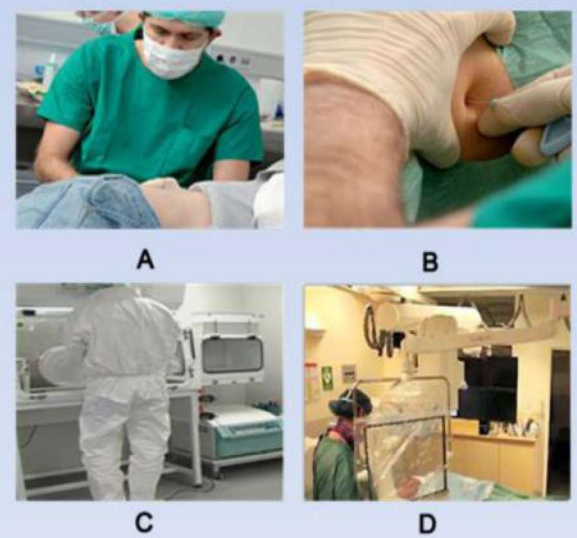


Figure 2: Bone Marrow collection procedure

A. Application of local anesthesia
B. Bone Marrow collection by needle insertion in the hip bone
C. Isolation of Stem Cells in the clean room
D. Intra-arterial catheter based Injection of stem cells at the targeted site

3. **Stem cell Implantation**: - Once isolated, intensified and ready for reinstalling back into the body, we work out different mode of implantation; depending upon patient's health condition.

4.

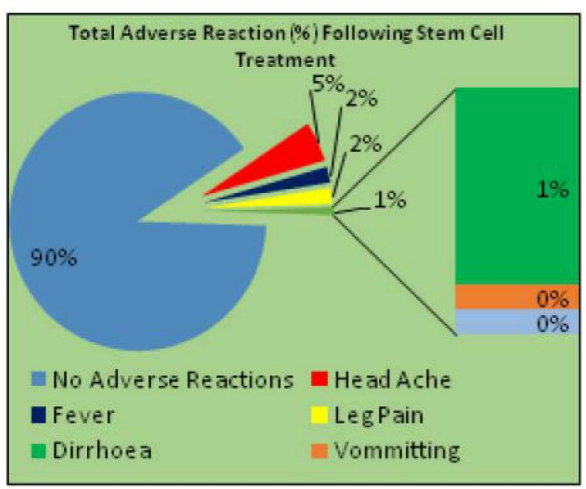
ADVANCELLS STEM CELL TREATMENT		
ELIGIBILITY CRITERIA	STEM CELL SOURCES	IMPLANTATION
Pre Treatment Assessments • Routine Blood Tests • Routine Urine Analysis • Sputum Testing • Infectious disease testing • Physical Examination • X Ray **Pre-op Procedures** • Spirometry Test • Other lung function Test • MRI • CT Scan • Medical History **Counselling**	The source of stem cells can either be Bone Marrow or Adipose Tissue or Both depending upon the assessment. • **Bone Marrow:-** 100-120 ml of bone marrow is collected from iliac crest with the application of general anaesthesia. • **Adipose Tissue (Fat):-** 100 cc adipose tissue is collected from the belly area with application of local anaesthesia.	Specialists exercise various input options for implanting cells back into the body depending upon physical condition and treatment demand. • **Intravenous Injections (IV):-** Infusion through vein • **Intra-arterial Injections:-** Infusion through thin catheter directly at the target

4. **Rehabilitation**: - Post treatment care involves reclamation therapies such as Physiotherapy, Occupational Therapy, Speech Therapy, patient's counselling etc for accelerated recovery. The follow up schedule will be provided at the time of discharge.

ADVANCELLS STEM CELL TREATMENTS	
Quality Control Parameters	Post Treatment Care
Cell counting & Viability Assessments • Stem cell isolation and separation from unwanted cells • Number of cells recovered through Trypan Blue Viability Assessments • Percentage of Live cells • Documentation **Flow Analysis /characterisation of Bone Marrow Mononuclear Cells (BMMSCs)** • Total percentage of CD 34+ and CD45+ cells recovered **Flow Analysis /characterisation of Adipose Tissue (SVF Cells)** • Total percentage of CD 73+and CD90+ and CD 105+ cells recovered	**Rehabilitation** • Strength Training exercises • Oxygen Therapy • Counselling to understand medical problem, quit smoking, healthy diet tips • Psychological support for depression, mood swings, anxiety etc. • Evaluation and Follow up
Our client will get a third party certificate from an internationally accreditated lab for the cell count and viability.	

Possible Adverse events from the treatments

Since stem cell therapy in minimally invasive and reasonable safe procedure none of our patients treated so far have observed any major offshoot from the transplant, but complaints are consistent with the expected reaction to routine IV/LP injections such as fever, headache, pain, diarrhoea, vomiting and allergic reactions. Less than 5% of our patients have experienced any of these symptoms.



Follow Up

Once you have returned home, a member of our medical team will monitor your progress in given intervals via telephone and email. For your convenience, a telephone 'hotline' is always at your disposal.

General

No additional charges will be incurred unless you are required to extend your stay at the medical center as a result of complications. Costs do not include additional stem cell treatments. If another treatment is necessary, we will discuss potential options with you. You will receive an invoice one week prior to treatment. This invoice must be paid in-full before treatment can begin.

Note: If your bone marrow/adipose tissue sample is negative or the stem cells cannot be administered due to unforeseen medical circumstances, you will only be required to pay charges incurred to that point. In the case of a negative sample, it might be possible to schedule another collection.

Contact us

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